

REPORT

# Enhanced Recovery After Surgery

Surgical Services Taskforce and  
Anaesthesia Perioperative Care Network



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# 1. Web Resource

## Purpose

The purpose of the web resource is to support sites interested in implementing an ERAS Model of Care and will provide:

- an explanation of the ERAS concept,
- information about general ERAS components utilised across different specialties, and
- detailed information on one specialty specific example, colorectal surgery.

The web resource will also provide examples of established ERAS services in NSW public hospitals and outline the benefits and barriers of implementing ERAS. The ACI developed this web resource through interviews with colorectal surgeons, ERAS coordinators and anaesthetists involved in the process at Concord, Royal Prince Alfred (RPA) and St George hospitals. The experience of a patient who participated in the ERAS program was also captured.

## Introduction

Enhanced Recovery After Surgery (ERAS) utilises strategies to optimise the patient's condition for surgery and recovery. In particular, the aim is to achieve an earlier discharge from hospital for the patient and a more rapid resumption of normal activities after surgery, without an increase in complications or readmissions. This is underpinned by collaboration between surgical and anaesthetic teams. While elements of ERAS may vary between surgical units and hospitals, there are many common features in the preoperative, intraoperative and postoperative phases.

A literature search was conducted by the Brian Tutt Library for the ACI and a review of the literature has been completed. It has been recognised that ERAS is now considered by many to be standard care (Nelson, Kalogera & Dowdy 2014). Through this review, the benefits associated with ERAS were identified. Bona et al (2014) noted these benefits to be quicker postoperative recovery and decreased length of stay in comparison to conventional care. It has also been found that while length of stay is decreased, this has not compromised readmission rates (Coolsen et al 2013). Other benefits show that ERAS is associated with lower rates of complication and does not compromise patient safety (Shao et al 2014; Ly, Shao & Zhou 2012).

The key components of ERAS programs are the perioperative management for patients beginning preoperatively, through the intraoperative process and continued postoperatively (Figure 1). Notably, the production and utilisation of ERAS guidelines/protocols simplifies and demystifies care for patients, clinicians and allied health staff, promoting inter-disciplinary care. Certain innovations in patient care have accompanied the use of ERAS programs, including the use of explicit discharge criteria that allow advanced planning of discharge timing/arrangements with all staff and patients able to appreciate and work towards these criteria. Ideally, discharge criteria are best agreed locally by consensus. For example, some clinicians support patients being discharged before their bowels have been opened after colorectal surgery, while others are less keen on this approach.

Additionally, ERAS programs have introduced alterations to traditional care, such as the use of:

- chewing gum in the postoperative period to stimulate gut function (Short et al. 2015)

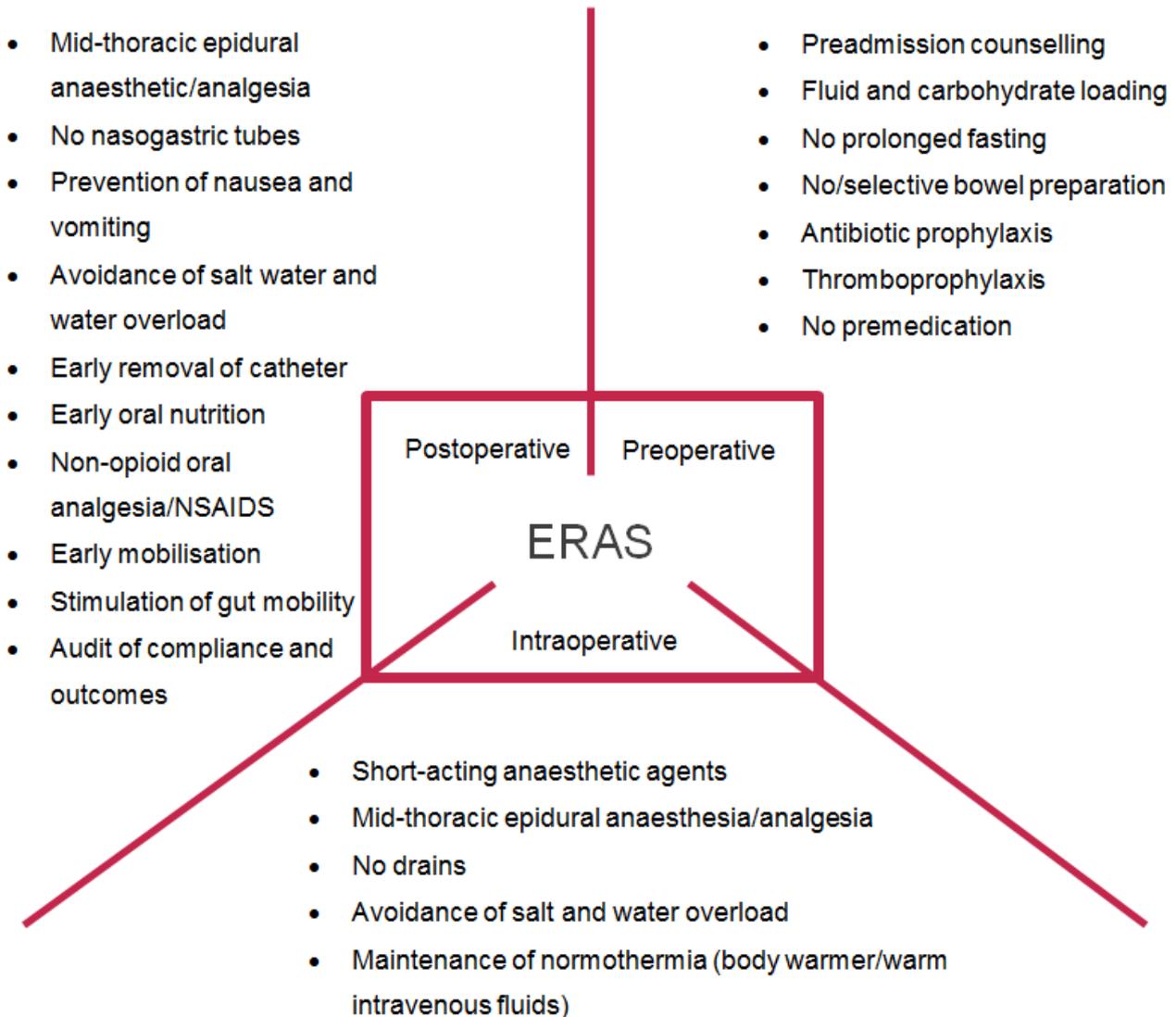
- administering Alvimopan (Ehlers et al., 2016), a drug that acts as a peripherally acting  $\mu$ -opioid antagonist
- using bedside ultrasound of the stomach to confirm gastric emptying and allowing safe introduction/progression of feeding in the postoperative period (Mirbagheri et al., 2016).

One unanswered question from these research studies remains - which combination of elements provides the best outcomes in terms of length of stay, quality of life, postoperative morbidity, complications and readmission rates (Sturm & Cameron 2009).

While the ERAS Society describes a comprehensive list of elements needed to implement ERAS, it is not uncommon for sites to adopt local guidelines and policies to incorporate as many of these components as possible. This is important as benefits to patients, clinicians and managers have been identified in ERAS programs that do not contain **all** of the elements recommended by the ERAS Society. A 75 to 80 per cent compliance with ERAS may mean 30 to 40 per cent fewer complications (Gustafsson et al 2011).

## Fig 1: ERAS Components Utilised Across Different Specialties

A number of the components utilised in ERAS are common across different specialties. In the preoperative phase, common components include optimising the patient's condition through cessation of smoking and alcohol and through identification and treatment of anaemia. Patients are also allowed clear fluids up to two hours prior to surgery. Components in the intraoperative phase include minimally invasive surgery and avoidance of routine nasogastric intubation. Postoperatively, patients are provided multimodal analgesia and are mobilised early.



Melnyk M, Casey RG, Black P, Koupparis AJ. Enhanced Recovery After Surgery (ERAS) protocols: Time to change practice? Can Urol Assoc. 2011 Oct. 5 (5): 342-348

**Fig: 2 Conventional Surgery compared to Enhanced Recovery After Surgery for Bowel Resection**

The differences between conventional surgery for a bowel resection and Enhanced Recovery After Surgery are outlined in the figure below.

<b>Conventional Surgery</b>								
Pre-admissions	Day Zero	Day One	Day Two	Day Three	Day Four	Day Five	Day Six	Day Seven to Eleven – Discharge Criteria
<ul style="list-style-type: none"> <li>• Pre-admission assessment and patient information provided</li> <li>• Mechanical bowel preparation</li> </ul>	<ul style="list-style-type: none"> <li>• Nil by mouth</li> <li>• Drain</li> <li>• Nasogastric (NG) Tube</li> <li>• Intravenous Therapy (IVT)</li> <li>• Patient Controlled Analgesia (PCA)</li> <li>• Indwelling catheter (IDC)</li> <li>• Bed rest</li> </ul>	<ul style="list-style-type: none"> <li>• NG Tube</li> <li>• Nil by mouth</li> <li>• Deep breathing</li> <li>• IVT</li> <li>• PCA</li> <li>• Bed rest</li> <li>• Drains</li> </ul>	<ul style="list-style-type: none"> <li>• NG Tube removed</li> <li>• Sit out of bed</li> </ul>	<ul style="list-style-type: none"> <li>• Clear liquids if bowelsounds present</li> <li>• Catheter removed</li> <li>• Sit out of bed</li> </ul>	<ul style="list-style-type: none"> <li>• Clear liquids if bowelsounds present</li> <li>• Walk with assistance of physiotherapist</li> </ul>	<ul style="list-style-type: none"> <li>• Full liquids</li> <li>• IV removed – commence oral analgesics</li> <li>• Walk with the assistance of physiotherapist</li> </ul>	<ul style="list-style-type: none"> <li>• Soft diet</li> <li>• Walk independently</li> </ul>	<ul style="list-style-type: none"> <li>• Appropriate pain control with oral analgesia</li> <li>• Taking solid foods, no IV fluids</li> <li>• Independently mobilise or same level as prior to admission</li> <li>• Return of gut functions</li> </ul>
<b>Enhanced Recovery After Surgery</b>								
Pre-admissions	Day Zero	Day One	Day Two/Three	Day Four- Discharge Criteria				
<ul style="list-style-type: none"> <li>• Pre-admission assessment</li> <li>• Avoid bowel preparation</li> <li>• Patient information provided</li> <li>• ERAS specific education</li> <li>• Prehabilitation</li> <li>• Oral Supplements</li> </ul>	<ul style="list-style-type: none"> <li>• Sit out of bed</li> <li>• Eating and drinking as tolerated</li> <li>• IVT</li> <li>• PCA</li> <li>• IDC</li> <li>• Chewing gum</li> </ul>	<ul style="list-style-type: none"> <li>• Mobilisation – sit out of bed for at least 6hrs/day and walk</li> <li>• Catheter removed</li> <li>• Drains removed</li> <li>• Eating and drinking as tolerated</li> <li>• Transition to oral analgesics</li> <li>• Cease PCA</li> <li>• Cease IVT</li> </ul>	<ul style="list-style-type: none"> <li>• Mobilisation – sit out of bed for at least 6hrs/day and walk</li> <li>• Normal diet</li> </ul>	<ul style="list-style-type: none"> <li>• Appropriate pain control with oral analgesia</li> <li>• Independently mobilise or same level as prior to admission</li> <li>• Return of gut functions</li> <li>• Follow-up phone call post discharge</li> </ul>				

## Specialty Specific Example – Colorectal

Following on from Figure 2, the following table outlines in more detail the components of a colorectal ERAS pathway.

What are the main components of the ERAS Pathway – preoperatively, intraoperatively and postoperatively?	
Preoperative	<ul style="list-style-type: none"> <li>• Education relevant to the specific pathway elements provided by allied health, nursing and medical staff</li> <li>• Information is provided in a manner that supports health literacy needs and builds trust</li> <li>• Prehabilitation – an opportunity to optimise the patient’s condition prior to surgery</li> <li>• Set patient expectations</li> <li>• Specialised carbohydrate drinks</li> <li>• No / minimal bowel preparation</li> <li>• Smoking and alcohol cessation</li> </ul>
Intraoperative	<ul style="list-style-type: none"> <li>• Pneumatic calf compression</li> <li>• Subcutaneous medical thromboprophylaxis</li> <li>• Laparoscopic surgery (where possible)</li> <li>• Regional blocks and/or local anaesthesia</li> <li>• Avoidance of nasogastric tube insertion</li> <li>• Minimise drain insertion</li> <li>• Multimodal analgesia</li> <li>• Avoid excessive amounts of intravenous fluid administration</li> <li>• Maintain normothermia</li> <li>• Prescribed antiemetics</li> <li>• Minimise IV fluid</li> </ul>
Postoperative	<ul style="list-style-type: none"> <li>• Urinary catheter to be removed on day one</li> <li>• Mobilise on day one</li> <li>• Commence diet on day one</li> <li>• If used, drains to be removed early e.g. on day one</li> <li>• Anti-nausea management</li> <li>• Patient Controlled Analgesia – transition on day one to oral analgesics</li> <li>• Patients invested and motivated to meet set goals to expedite discharge</li> <li>• Patients complete a diary to document their diet and how mobile they have been.</li> <li>• If appropriate, Criteria Led Discharge may be used to standardise discharge arrangements for ERAS patients.</li> <li>• Follow-up phone call post discharge</li> </ul>

### What are the benefits of using ERAS for the patient and the facility?

- Lower rates of complication
- Patients are more actively involved in their care from a holistic approach
- Patients and their relatives are empowered to become engaged by the process
- Qualitative data demonstrates that patients appreciate the personalised care and frequent interaction with the ERAS coordinator.
- Reduced readmission rates
- Decreased length of stay
- Reduces number of patients on waiting list
- Increased staff confidence with regard to clinical management
- Junior doctors have clinical guidelines to simplify postoperative patient care

### What are the challenges to implementation?

In their interviews, clinicians from the three hospitals highlighted some considerations for sites looking to implement an ERAS program.

Achieving consensus amongst key stakeholders such as surgeons, anaesthetists, ICU staff and allied health is challenging but is not a barrier to the introduction of ERAS programs. For example, where they existed, consensus issues on fasting times and bowel preparation were resolved differently at each site.

Introducing a new model of care has the potential to impact on resourcing. For the sites involved, the introduction of the ERAS program had a flow on effect to the physiotherapy service in order to support patients in the pre and post-operative phases. Similarly, the need for additional capacity within the preadmission clinic was also identified.

Ideally, patients participating in the ERAS program should go to postoperative wards where the clinical staff are educated on ERAS principles and local processes. This may require a dedicated ward depending on volume and may involve a change in bed management processes.

It is acknowledged that new graduates, staffing turnover and junior medical officer changeover may impact upon the implementation of ERAS. Therefore, ongoing education of new medical, nursing and allied health staff is required. This is because they may not have been exposed to ERAS before and require education and guidance on local processes. For example, it was identified that junior staff may not follow the pathway unless the next step is clearly documented in the patient notes.

The three sites interviewed had established an ERAS coordinator position in order to implement the program. As this was a newly established role, it had funding implications. However, it was emphasised by all three sites that the reduced length of hospital stay and complication rates have led to overall net financial savings.

## What are the enablers to implementation?

Clinical leadership is an essential requirement for implementing a new model of care.

Implementation should be guided by an agreed project plan which is appropriately resourced. Local steering committees and working groups should be established to support the ERAS coordinator/project lead in developing and implementing an ERAS program.

It is essential to identify all relevant stakeholders who may be impacted by the introduction of an ERAS pathway. This includes clinical and non-clinical staff and will require executive leadership. Developing and agreeing on clinical pathways will assist with clinical consensus regarding the management of ERAS patients.

It is important that steps are taken to ensure that Enhanced Recovery After Surgery is delivered in a culturally safe and competent way to allow for Aboriginal and diverse minority groups.

To achieve optimal health outcomes for Aboriginal people it is recommended that implementation of the model include the establishment of clear opportunities for identification of Aboriginality.

Linkages with and referral processes are established with appropriate health and support agencies, with a particular focus on the unique role of local Aboriginal Medical Services.

The ACI provides a number of implementation support tools to assist with project implementation which are available at:

**<http://www.aci.health.nsw.gov.au/make-it-happen/implementation-support>**.

## Patient Experience – Zoe’s story

Zoe is a patient with multiple comorbidities. She was admitted to hospital with a bowel obstruction. She was approached by the ERAS coordinator about the proposed surgery and asked to participate in the ERAS program.

The majority of ERAS patients are seen in the preadmissions clinic prior to surgery, in order for clinicians to identify ways to optimise their condition. Zoe described ‘prehabilitation’ as optimising her condition before surgery, through identifying comorbidities and involving relevant clinicians early, such as dietetics and anaesthetics. Zoe also needed a blood transfusion to optimise her condition prior to surgery. One of the most important components she identified in her preoperative care was education. She was given a comprehensive booklet that explained the ERAS process clearly and set out expectations for each day following the surgery. The implications of any setbacks were also explained, for example, that length of stay would be extended if an ileostomy was needed. Zoe was given instructions to have carbohydrate loading drinks up to two hours before the surgery.

Zoe was able to eat frequent small meals immediately after the surgery. The day following the surgery, she was up walking and the PCA was removed. She had an ON-Q ball for pain relief, which continually delivered local anaesthetic to the site of incision. The physiotherapist visited once per day, including over the weekend.

Zoe completed a diary that identified every time she ate, mobilised and various other milestones post-surgery. She referred to the ERAS program as “surgery bootcamp” and stated that she was determined not to be caught in bed! This was mainly because she was so motivated to meet the milestones that would allow her to be discharged on Day 4. While Zoe was discharged on Day 5 this was still a fantastic outcome, particularly given her comorbidities. The ERAS coordinator called Zoe 1-2 days following her discharge to check on her progress. Zoe was also pleasantly surprised that there was communication to the GP and that she did not have to follow this up herself.

From the patient perspective, Zoe identified a number of benefits of the ERAS program:

- Patient expectations were set early.
- Patient was incredibly motivated to adhere to the ERAS pathway.
- Patient was actively involved in their care – options are made available to them rather than being told what to do.
- Clear communication – between teams and with the patient. In Zoe’s case, the communication process was also extended to include the oncology team.
- Doctor took the time to explain all potential scenarios prior to surgery.
- Poster on ward explained what to expect each day.
- Very organised process.
- Expectations were set with family, particularly for at home care after discharge.
- Clear instructions were given upon going home – for example, no lifting or driving.
- Follow up appointment (with surgeon and oncologist) was made when discharged – did not have to organise anything.
- Copy of discharge summary was provided to the patient for their records.

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